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Original Centers Concerned in North American Plant Dispersal.—JOHN W. HARSHBERGER, PH.D., remarked that the northern part of North America was covered during Miocene times with a dense forest of trees, the living representatives of which include the sequoias, magnolias, oaks, eucalyptus and species of the genus *Cinnamomum* and certain palms, and that these extended as far north as Greenland. As early as the close of the Cretaceous period we find an indication of the separation of the American flora into an eastern and a western division. In the eastern division, the deciduous trees perhaps predominated; in the western, the coniferous vegetation formed a large percentage of the floral elements. The great continental glacier destroyed this forest in the north, but remnants of it remained in the south.

At the close of the glacial period, the following centers of distribution of plants might have been recognized: first, the deciduous forest in the east; second, the prairie flora at the center of the continent; third, the great coniferous forest of the Pacific northwest; fourth, the desert or xerophytic flora of the Mexican tableland; fifth, the great American tropic flora which occupied at one time an Antillean continent that later broke up into several physiographic units, viz., the islands of the Greater Antilles, Central America and northern South America. While this Antillean landmass existed, Mexico was separated from it.

With the disappearance of the glacial ice sheet, the equilibrium between these separate floras was disturbed. The tundra vegetation and other Arctic species occupied during the glacial period the margin of the great ice sheet. These plants migrated north to the Arctic regions, but many remained behind to form the vegetation of sphagnum bogs and alpine summits of the higher mountains. The deciduous floras spread northward and northwestward, such plants as *Populus tremuloides* and *Betula papyrifera* reaching to Cook Inlet, Alaska. The prairie flora spread northward, reaching Saskatchewan, and southward to Texas. The Pacific coast conifers spread northward to Cook Inlet, Alaska, eastward to the Rocky Mountains and then southward, supplying one of the elements of the Rocky Mountain flora. The Mexican xerophytes—yuccas, agaves, cacti and the like—spread northward into a territory which was before the glacial period characterized by a more humid climate (hence the presence of many eastern deciduous trees), and which later assumed an arid climate with the consequent destruction of the deciduous element and the spread of the coniferous associations. The tropic center of northern South America, the West Indies, and Central America supplied part of Florida and much of lowland Mexico with tropic plants. The differences, now found, being emphasized by the separation of the islands from each other and the isolation of the floras by physiographic changes.

A study of the several regions above mentioned emphasizes the fact, that centers of distribution are determined by the following criteria: location of the greatest differentiation of type; of dominance or great abundance of individuals; of the presence of peculiar endemic forms; of the continuity and convergence of lines of dispersal.